

IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF PENNSYLVANIA

Hartle et al.,

Plaintiffs,

v.

Civil Action No. 08-1019

FirstEnergy Generation Corp.,

Defendant.

Patrick et al.,

Plaintiffs,

v.

Civil Action No. 08-1025

FirstEnergy Generation Corp.,

Defendant.

Price et al.,

Plaintiffs,

v.

Civil Action No. 08-1030

FirstEnergy Generation Corp.,

Defendant.

MEMORANDUM OPINION

CONTI, Chief District Judge

I. Introduction

Before the court are expert challenges in three cases consolidated for discovery, *Hartle v. FirstEnergy Generation Corp.* (08-1019), *Patrick v. FirstEnergy Generation Corp.* (No. 08-1025), and *Price v. FirstEnergy Generation Corp.* (No. 08-1030). These cases involve the Bruce Mansfield Power Plant (“Bruce Mansfield”), a coal-fired electric generating facility owned and operated by defendant FirstEnergy Generation Corporation (“FirstEnergy” or “defendant”). Bruce Mansfield is located along the Ohio River in Shippingport, Pennsylvania. The plaintiffs allege harm from air pollution discharged by Bruce Mansfield. The alleged pollution came in the form of “white rain,” a chronically discharged corrosive material, and “black rain,” a dark-

colored sooty residue discharged on two occasions in 2006 and 2007. The white rain and black rain were deposited on the area surrounding Bruce Mansfield, allegedly causing property damage and adverse health effects. The plaintiffs in *Hartle* are two parents seeking damages for adverse health effects sustained by their minor daughter. The named plaintiffs in *Patrick* are four couples who make class-action claims for damages due to diminution of property value and seek to enjoin the plant from operating until it can prevent the white rain emissions. In *Price*, nineteen plaintiffs seek monetary damages for adverse health effects and property damage and seek injunctive relief.

The parties conducted extensive fact and expert discovery in these cases. Defendant filed motions to limit or preclude the testimony of twelve of plaintiffs' experts. Plaintiffs filed motions to limit or preclude the testimony of seven of defendant's experts. This memorandum opinion addresses two of plaintiffs' challenged geology, chemistry, and sampling experts—Carol A. Erikson (“Erikson”) and Charles H. Norris (“Norris”).¹ The motions to exclude these experts are fully briefed. As set forth below, the motions to preclude Erikson and Norris will be granted in part and denied in part.

II. Legal Standards

Federal Rule of Evidence 702 governs the admissibility of expert testimony and states:

A witness who is qualified as an expert by knowledge, skill, experience, training, or education may testify in the form of an opinion or otherwise if:

¹ The motions to preclude the opinions of Erikson are ECF No. 168 (*Patrick*) and ECF No. 111 (*Price*). The motions to preclude the opinions of Norris are ECF No. 98 (*Hartle*), ECF No. 157 (*Patrick*), and ECF No. 84 (*Price*). Unless otherwise noted, ECF numbers appearing in the text of this opinion refer to the *Patrick* case, No. 08-1025.

- (a) the expert's scientific, technical, or other specialized knowledge will help the trier of fact to understand the evidence or to determine a fact in issue;
- (b) the testimony is based on sufficient facts or data;
- (c) the testimony is the product of reliable principles and methods; and
- (d) the expert has reliably applied the principles and methods to the facts of the case.

FED. R. EVID. 702. Under the seminal case of *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579 (1993), district courts must act as gatekeepers to “ensure that any and all scientific testimony or evidence admitted is … reliable.”² *Id.* at 589. The United States Court of Appeals for the Third Circuit explained that Rule 702 “embodies a trilogy of restrictions” that expert testimony must meet for admissibility: qualification, reliability and fit. *Schneider ex rel. Estate of Schneider v. Fried*, 320 F.3d 396, 404 (3d Cir. 2003). The party offering the expert testimony has the burden of establishing each of these requirements by a preponderance of the evidence. *In re TMI Litig.*, 193 F.3d 613, 663 (3d Cir. 1999).

A. Qualification

An expert witness’s qualification stems from his or her “knowledge, skill, experience, training, or education.” FED. R. EVID. 702. The witness therefore must have “specialized expertise.” *Schneider*, 320 F.3d at 405. The court of appeals interprets the qualification requirement “‘liberally,’ holding that ‘a broad range of knowledge, skills, and training qualify an expert as such.’” *Calhoun v. Yamaha Motor Corp., U.S.A.*, 350 F.3d 316, 321 (3d Cir. 2003) (quoting *In re Paoli R.R. Yard PCB Litig.*, 35 F.3d 717, 741 (3d Cir. 1994)). When evaluating an expert’s qualifications, district courts should not insist on a certain kind of degree or background. *Robinson v. Hartzell Propeller Inc.*, 326 F. Supp. 2d 631, 667 (E.D. Pa. 2004). An expert’s

2 While *Daubert* applied exclusively to scientific testimony, see *Daubert*, 509 U.S. at 590 n.8, the Supreme Court subsequently extended the district court’s gatekeeper function to all expert testimony. *Kuhmo Tire Co. v. Carmichael*, 526 U.S. 137, 147 (1999).

qualifications are determined with respect to each matter addressed in the proposed testimony. *Calhoun*, 350 F.3d at 322 (“An expert may be generally qualified but may lack qualifications to testify outside his area of expertise.”). “While the background, education, and training may provide an expert with general knowledge to testify about general matters, more specific knowledge is required to support more specific opinions.” *Id.*

B. Reliability

In *Daubert*, the Supreme Court stated that the district court’s gatekeeper role requires “a preliminary assessment of whether the reasoning or methodology underlying the testimony is … valid and of whether the reasoning or methodology properly can be applied to the facts in issue.” *Daubert*, 509 U.S. at 592–93. While the Court noted in *Daubert* that district courts were permitted to undertake a flexible inquiry into the admissibility of expert testimony under Rule 702, the court of appeals has enumerated the following eight factors that a district court may examine:

1. whether a method consists of a testable hypothesis;
2. whether the method has been subjected to peer review;
3. the known or potential rate of error;
4. the existence and maintenance of standards controlling the technique’s operation;
5. whether the method is generally accepted;
6. the relationship of the technique to methods which have been established to be reliable;
7. the qualifications of the expert witness testifying based on the methodology; and
8. the non-judicial uses to which the method has been put.

In re Paoli R.R. Yard PCB Litigation, 35 F.3d 717, 742 n.8 (3d Cir. 1994) (“*Paoli II*”). This list of factors is a “convenient starting point,” but is “neither exhaustive nor applicable in every case.” *Kannankeril v. Terminix Int’l, Inc.*, 128 F.3d 802, 806–07 (3d Cir. 1997).

Under these factors, experts are not permitted to engage in a “haphazard, intuitive inquiry,” but must explain the research and methodology they employed in sufficient detail in order to allow the other party’s expert to test that hypothesis. *Oddi v. Ford Motor Co.*, 234 F.3d 136, 156 (3d Cir. 2000). Where an expert fails to use standards to control his or her analysis, “no ‘gatekeeper’ can assess the relationship of [the expert’s] method to other methods known to be reliable and the non-judicial uses to which it has been put.” *Id.* at 158.

“The evidentiary requirement of reliability is lower than the merits standard of correctness.” *Paoli II*, 35 F.3d at 744. “As long as an expert’s scientific testimony rests upon ‘good grounds, based on what is known,’ it should be tested by the adversary process—competing expert testimony and active cross-examination—rather than excluded from jurors’ scrutiny for fear that they will not grasp its complexities or satisfactorily weigh its inadequacies.” *United States v. Mitchell*, 365 F.3d 215, 244 (3d Cir. 2004) (quoting *Ruiz-Troche v. Pepsi Cola of P.R. Bottling Co.*, 161 F.3d 77, 85 (1st Cir. 1998)).

C. Fit

The Rule 702 requirement that testimony “help the trier of fact to understand the evidence or to determine a fact in issue” is called the “fit” requirement. Fit requires that there be a “connection between the scientific research or test result to be presented and particular disputed factual issues in the case.” *Paoli II*, 35 F.3d at 743. “Fit is not always obvious, and scientific validity for one purpose is not necessarily scientific validity for other, unrelated purposes.” *Id.* (quoting *Daubert*, 509 U.S. at 591). The standard for fit is “not that high,” although it is “higher than bare relevance.” *Id.* at 745.

III. Discussion

A. Defendant’s Motions to Preclude the Testimony of Erikson

Erikson is a chemist and quality assessment manager for Trillium, Inc., an environment consulting firm. Erikson prepared an expert report (“Erikson Rep.”)

dated July 23, 2012, in which she evaluated the ratios of arsenic, cadmium, lead, and zinc in samples taken from four locations at Bruce Mansfield. Samples were collected from three locations inside the plant: the scrubbers in 2009, the stack drains in 2012, and the flues in 2007. Samples were taken from a guard shack on plant grounds in 2010. After analyzing these samples, Erikson opined that the ratio of the metals showed a similar pattern. (Erikson Rep. 1, ECF No. 171-1.) She concluded that “[t]he consistency of this pattern of metals in samples taken at widely different times, from three different locations within the stacks, and likely when coal from different sources was being burned is remarkable, and suggests that it is a reasonable marker for the airborne material released by the plant.” (*Id.*) On August 27, 2013, Erikson submitted an addendum (“Erickson Add.”) revising the analysis of the scrubber samples. (Erickson Add. 1, ECF No. 238-3.) Erikson’s conclusion remained unchanged after the revision. (*Id.*)

Defendant moved to exclude Erikson’s opinions because the data reveal no consistent pattern among the samples. (ECF No. 170, at 2.) Plaintiffs argue that there is a consistent pattern and that the addendum makes the pattern even more apparent. (ECF No. 238, at 2–3.) Plaintiffs state that Erikson did not review “data for any samples collected off BMP property.”³ (*Id.* at 4.)

After reviewing Erikson’s report and addendum, the court is unable to discern any consistent pattern in the samples. For each of the samples, Erikson prepared a

³ As directed by the court, plaintiffs filed a summary of all expert opinions in these cases. (ECF No. 267.) The summary states that,

[h]aving evaluated samples collected, Ms. Erickson [sic] determined that the pattern of metals in samples taken from Plaintiffs’ properties demonstrates that it is a reasonable marker for the airborne material released by [Bruce Mansfield]. Thus, it is scientifically reasonable to conclude that stack rain from [Bruce Mansfield] has impacted Plaintiffs’ properties.

(*Id.* at 7.) The court assumes that plaintiffs’ brief in opposition controls and that the summary is in error. Erikson’s report and addendum offer no basis for the opinions described in the summary, and Erikson will not be permitted to so testify.

graph showing the amounts of arsenic, cadmium, and lead relative to zinc. The graphs are summarized in the following chart.

Location of samples	Arsenic (approximate percentage relative to zinc)	Cadmium	Lead
Scrubbers*	170	<5	20
Stack drains†	60–70	2	5
Flues‡	160–300	<5	25
Guard shack**	0–10	0	5

* Erikson Add. fig.1, ECF No. 238-3.

† Erikson Rep. fig.2, ECF No. 171-1.

‡ Erikson Rep. fig.3, ECF No. 171-1.

** Erikson Rep. fig.4, ECF No. 171-1.

Erikson testified that her basis for concluding that there is a pattern is “the fact that zinc and arsenic are strong components of those solids that were measured with smaller amounts of lead and cadmium detected in most or all cases, that that pattern of four metals seemed to be fairly consistent over time and from different locations from the plant.” (Erikson Dep. 105:3–11, Apr. 17, 2013, ECF No. 171-2.) Erikson admitted, however, that arsenic was not a strong component of the three samples taken from the guard shack. (*Id.* at 105:25–106:4.) Erikson also testified that the scrubber, flue, and stack drain samples had different ratios of arsenic to zinc. (*Id.* at 102:11–103:8.)

While admissibility determinations must focus on an expert’s methodology rather than conclusions, “a district court must examine the expert’s conclusions in order to determine whether they could reliably follow from the facts known to the expert and the methodology used.” *Heller v. Shaw Indus., Inc.*, 167 F.3d 146, 153 (3d Cir. 1999.) Although the samples from each location are fairly consistent with each other, the data and Erikson’s testimony show that there are marked differences among the locations. The opinion that there is a remarkably consistent pattern among the different locations does not reliably follow from the data, and Erikson’s report and

testimony do not demonstrate any other good grounds for this opinion. Erikson will not be permitted to opine that there is a consistent pattern among the sampling locations. To the extent the graphs she prepared of the testing data are relevant to understanding the metals contained in the samples, she may testify about the graphs and how they were prepared.

B. Defendant's Motions to Preclude the Testimony of Norris

Norris, a geologist and hydrologist, submitted an expert report ("Norris Rep.") dated December 2, 2008, concerning samples taken after the black rain event of July 22, 2006, FirstEnergy's cleanup efforts, and the persistence of metals organic compounds in the soil. Defendant argues that Norris's opinions about each of these three issues are unreliable and unhelpful and should be precluded.

1. Analysis of Sample Test Results

After the black rain event of July 22, 2006, several residents in the area affected by the incident collected samples of the black rain residue. These samples were tested by TestAmerica. Norris offered several opinions about the testing procedures and results. With respect to the testing procedures, Norris opined that (1) it is common and appropriate for a laboratory to test composite samples; (2) due to the delay in collecting and testing the samples and lack of temperature controls, the volatile and semivolatile organic compounds in the residue likely decayed, and the concentrations found by the testing were likely lower than the concentrations when the residue was deposited; and (3) the metals in the sample would likely be less affected by delay and lack of temperature control. (Norris Rep. 2, ECF No. 159-1.) Defendant points out that Norris testified he had no knowledge of how TestAmerica composited the material. (ECF No. 158, at 2; Norris Dep. 116:6–9, Mar. 28, 2013, ECF No. 159-3.) Norris's lack of knowledge about how TestAmerica composited the samples does not affect his ability to give an opinion that compositing is a common and appropriate practice in the testing industry. Defendant does not challenge Norris's opinions about

the effect of delay on organic compounds and metals. These three opinions are admissible.

With respect to analyzing the test results, Norris opined that (1) various metals—thallium, arsenic, mercury, selenium, boron, beryllium, cadmium, chromium, nickel, lead, antimony, and zinc—“exceeded one or more Pennsylvania criteria for soils” at the time of the event and (2) various organic and semivolatile compounds also exceeded one or more Pennsylvania criteria for soils. (Norris Rep. 3, ECF No. 159-1.) Defendant argues that Norris’s analysis is unreliable due to “numerous irregularities” concerning the collection of the samples. (ECF No. 158, at 1.) The “irregularities” include the collection of samples by a resident without scientific training and that the samples were submitted to TestAmerica without an appropriate chain of custody. Defendant offers no authority for the argument that a lack of an appropriate chain of custody or the collection of samples by a layperson renders opinions about testing data categorically inadmissible. The court concludes that these arguments bear on weight rather than admissibility.

Defendant challenges Norris’s opinion with respect to the organic and semivolatile compounds on the ground that the testing results for the semivolatile compounds were below the method detection limit.⁴ (*Id.* at 2–3.) TestAmerica reported these results as “ND,” meaning “nondetect.” (TestAmerica Analytical Report 3, ECF No. 159-5.) With respect to the compounds reported as nondetect, Norris

4 The method detection limit is the level below which the presence of a substance cannot accurately be determined:

In most circumstances involving possible contamination of environmental media, the analysis of some (and sometimes many) of the samples will fail to find the contaminant. The analytical chemist will often report “ND” (for nondetect) for such samples. But an ND should never be considered evidence that the concentration of the contaminant is zero. ... Every analytical method has a nonzero detection limit; the method is not sensitive to and cannot measure concentrations below that limit.

Joseph V. Rodricks, *Reference Guide on Exposure Science*, in REFERENCE MANUAL ON SCIENTIFIC EVIDENCE 503, 530 (3d ed. 2011).

opined that “nine semi-volatile compounds, including all seven carcinogens on the list, had detection limits that were so high the results cannot preclude concentrations that exceed one or more of the Pennsylvania limits.” (Norris Rep. 3, ECF No. 159-1.) This statement invites rank speculation and would not be helpful to the jury.⁵ See *In re TMI Litig.*, 193 F.3d at 670 (“[I]n order for expert testimony to be reliable, and therefore admissible, it must be based on the methods and procedures of science rather than subjective belief or speculation.”). Norris may explain that a result of “nondetect” does not mean the compound is absent from the sample. Norris may not speculate about whether the concentration of compounds reported as nondetect could exceed health standards.

Norris opined that five organic compounds “exceeded one or more of their respective concentration limits.” (Norris Rep. 3, ECF No. 159-1.) According to the test results, these compounds were detected in amounts below the limit of quantification,⁶ meaning that the reported concentrations are estimated values. (Norris Dep. 130:5–12, ECF No. 159-3.) A substance may be harmful at concentrations below the limit of quantification, but reported values below the limit of quantification are too uncertain to be scientifically reliable. See *Am. Iron & Steel Inst. v. EPA*, 115 F.3d 979, 994 (D.C. Cir. 1997) (noting that while the “EPA considers the discharge of certain toxic pollutants to be unacceptable even at levels” below the limit of quantification, the EPA does not consider measurements below the limit of quantification to be

5 The court finds Attachment II to Norris’s expert report to be potentially misleading to the jury, and it should not be introduced. The same red color is used to denote concentrations that exceed health standards and concentrations that “may” exceed health standards because the health standard for the compound is less than method detection limit.

6 “The limit of quantification … is the concentration at which the true concentration can reliably be measured. In many ways, [the limit of detection and limit of quantification] are simply points along a continuum that describes the relationship between true concentration and uncertainty.” ROBERT D. GIBBONS & DAVID E. COLEMAN, STATISTICAL METHODS FOR DETECTION AND QUANTIFICATION OF ENVIRONMENTAL CONTAMINATION 2 (2001).

accurate). With respect to the organic compounds found at levels below the limit of quantification, Norris may testify that these compounds were detected, but he must state that their concentrations cannot accurately be quantified and cannot opine that they exceed regulatory limits.

2. Opinion About Results of FirstEnergy's Black Rain Cleanup

Norris opined that FirstEnergy's efforts to clean up the black rain residue were likely ineffective and the metals and organic compounds in the residue remained on plaintiffs' properties after the cleanup. (Norris Rep. 3, ECF No. 159-1.) This opinion was expressed in highly equivocal language. For example, Norris stated that “[d]isposal of dusting cloths … may or may not have been appropriate for their composition.”⁷ (*Id.*) Norris admitted his knowledge of the cleanup efforts was limited to a general description. (Norris Dep. 114:4–115:1, ECF No. 159-3.) Norris may not speculate as to the effect of the cleaning on plaintiffs' properties, and he will be precluded from offering an opinion about what actually happened on plaintiffs' properties. Norris may opine, from his experience and training as a hydrologist, about the general effect of power washing contaminated surfaces.

7 The full opinion with respect to the cleanup is as follows:

Clean-up efforts by FirstEnergy would have had three potential results. For discharge emissions that were swept or wiped up, the organic and metal contaminants may have been removed from the property. Disposal of dusting cloths with and/or [sic] sweepings of the emissions may or may not have been appropriate for their composition. Emissions that were washed from surfaces and objects may have been transferred from the original surface to the ground or other surface on the same property or may have been washed or flushed along curbs or down drains for removal into surface water conveyance systems. Emissions that were knocked or brushed from objects and surfaces would have remained on the property where originally rained. Except for removal from the property where it rained by dusting or wiping cloths, sweepings that were collected and removed, or flushing down storm and surface water conveyances, the metals and organics that fell on people's property remained there following “clean-up” activities.

(Norris Rep. 3, ECF No. 159-1.)

3. Persistence of Organic Compounds and Metals in Soil

Norris opined that organic compounds in the soil will attenuate and that the “attenuation may be very quick or may take decades,” depending on the compound. (Norris Rep. 3–4, ECF No. 159-1.) The organic compounds may volatilize, biodegrade, or inorganically degrade. (*Id.* at 3.) He opined that metals “such as thallium and arsenic, largely are forever at the residences where they fell.” (*Id.* at 4.) These metals generally stay “bound in the soil until eaten, absorbed through the skin, or taken up by vegetation, including gardens, berry bushes, and fruit trees, or animals, including lets and livestock.” (*Id.*)

Defendant argues that these opinions consist of “hypothetical list[s] of possibilities” and have no basis in the facts and that Norris is not qualified to opine about health effects or possible exposure pathways. (ECF No. 158, at 4–5.) Plaintiffs argue that the opinions provide “useful context” to Norris’s opinions about the test results. (ECF No. 237, at 8.) To the extent it would be relevant, Norris may offer a general opinion about the persistence of organic compounds and metals in soil. Since Norris is not a toxicologist or medical professional, his comments about the possible ingestion or dermal absorption of metals will be stricken from his report and he may not opine about those matters.

IV. Conclusion

As set forth above, the motions to preclude the expert testimony of Erikson will be granted in part and denied in part. Erikson may not opine that there is a consistent pattern in the ratios of arsenic, cadmium, lead, and zinc among the sampling locations. She may testify about the graphs of the ratios if the graphs are relevant to understanding a fact at issue. The motions to preclude the expert testimony of Norris will be granted in part and denied in part. His testimony will be limited in accordance with this opinion. An appropriate order will be entered.

Dated: March 7, 2014

/s/ Joy Flowers Conti

Joy Flowers Conti

Chief United States District Judge